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MEMORANDUM FOR THE RECORD

19 JUN 1962

SUBJECT : Development of High Temperature Fuel Tank Sealant

NRO DECLASSIFICATION/RELEASE INSTRUCTIONS ON FILE

1. The successful development of the A-12 aircraft requires a solution to the fuel tank sealant problem arising from the airframe structural requirement for a considerable number of fillets and spot welded lap joints. The sealant material should have a 1000 hour service life under the predicted environment of 350°F when immersed in fuel and a possible 550°F condition in a fuel vapor-nitrogen atmosphere. This memorandum describes the progress toward, and the future program in, developing a satisfactory sealant.

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2. The first aircraft was originally treated with a sealant based on a [redacted] product, namely, a fluorinated copolymer called [redacted]. Limited testing showed that it should have adequate fuel and temperature resistance. However, actual installation in the test aircraft resulted in severe leakage and adhesion failure. This required stripping all of the sealant from the tanks. A family of lower temperature performance sealants, supplied by Minnesota Mining and Manufacturing Company having a limited service life of 450°F-500°F, was installed to permit flight testing of the aircraft. These particular sealants have performed successfully so far in our flight test program. However, they have not yet been subjected to high temperatures in the aircraft.

3. In order to develop a satisfactory sealant, the following test and development program is now under way:

a. The Aeronautical Systems Division (ASD) at Wright-Patterson Air Force Base has been tasked to provide support in this program. ASD will provide cover, technical support and actual test evaluation.

b. Dynamic testing at these high temperatures will be accomplished in full and partially loaded fuel tanks at an Air Force-owned facility at the Boeing Aircraft Wichita plant. This facility will operate under ASD's guidance.

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4. Search for a satisfactory material for testing and evaluation continues along the following lines:

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a. Several candidate materials have been received from Minnesota Mining and Manufacturing Co., [REDACTED]. They will be evaluated as received and studied as to their possible modifications accomplished. It is our estimate that if one of these does not satisfy our requirement within the next three or four months, the required development program will take approximately nine months to produce a satisfactory material.

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b. ASD has a development contract with [REDACTED] for work on a very promising material. It is hoped that this long-range effort could produce a material good to 700° or 800°F.

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c. We are currently considering establishing applied research and development programs at both [REDACTED] and Minnesota Mining and Manufacturing to back up our entire effort in this field.

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5. On the more optimistic side, if the temperatures reached in actual flight are less than predicted, the original Minnesota Mining and Manufacturing Company material which is now in the test aircraft could be satisfactory.

SIGNED

EDWARD B. GILLER
Technical Assistant to the Deputy Director
(Research)

DD/R:ebg/jlp (19 June 1962)

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Chairman, PEIAB

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The enclosed memorandum is a status report on our progress in solving the tank sealant problem in the A-12.

We are currently encouraged by the results of our Minnesota Mining and Manufacturing Company material in the first test aircraft, so much so that we feel this problem will be solved in time to permit the earliest operational use of the aircraft.

Herbert Scoville, Jr.
DD/R

6/19/62

Buck sheet attached to [REDACTED] 1173-62.

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